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through which the increase of wealth is caused, which enables the laborer to become a capitalist. Then the political economists may meet together and discuss the improved social order, burn their old books, and erect a monument to the man who above all others contributed the means for obtaining the wealth of nations, James Watt, the engineer. WILLIAM KENT.

JOHN ADAM RYDER.*

IN 1875, exactly one score of years ago, John A. Ryder began his work at the Academy. Six of these years were spent in the service of the government. The remaining fourteen were in close communion with these halls. The museum and library were the scenes of his many labors.

At one time his friends feared that he was covering too large a field. Doubtless, the fear would have been sustained if Ryder had pursued his studies along conventional lines. But we must not judge him by such a standard. His mental attitude was well poised. The objects that 'swam into his ken' came from a wide space. So long as he was searching for the results of vital forces on the economy, it mattered little to him whether it was the teeth of mammals, the tails or scales of fishes, or the movements of protoplasm in a rhizopod that illustrated these actions.

While arranging the collections of the Academy as a Jessup Fund student he found material for his studies in teeth of quadrupeds; while on excursions in the city park, in the smaller articulated animals feeding on fungi or swimming in pools; while on the Fish Commission, in the oyster and its parasites and the movements of fishes; as professor of histology and em-

bryology at the University, in the preparation of specimens for courses of instruction.

What were the mental forces that operated in Ryder to make him what he was? This is of interest, for the result of comparative studies is to aid us in knowing ourselves. How strange is the phenomenon! First, a young student coming to the Academy so absolutely unknown that his first application to a position on the Jessup Fund was deferred. Second, his obtaining the position and setting to work on the collection, rearranging and cleansing specimens, refilling jars and cataloguing. Third, after a career of four years attracting the attention of Professor Baird and leaving the city to accept an appointment on the Fish Commission. Fourth, returning to Philadelphia in 1887 and again in frequenting the Academy, no longer working on its collections, but consulting its library and speaking at its meetings as a University professor. So we find Ryder at the beginning and at the end of his career part of the Academy. But where, in this chain of circumstances, do we find the factors which gave to Ryder those things which distinguish him? Almost precisely the same conditions (so far as the Academy and the University were concerned) were met with in Leidy. Yet how different were the two men! Indeed, so little did Leidy understand Ryder that he endeavored (with the most kindly motive) to dissuade him from a career of study. Leidy knew that men who are dependent on science for a livelihood secure fewer prizes in the struggle for maintenance than do those in any other learned calling. This statement is yet true, and it had special force twenty years ago.

Thus while the Academy gave Ryder incalculable aid (the soil, indeed, in which he grew), the influences which determined the character of his work were extraneous. These were in brief the influences of the

*An address on 'Dr. Ryder's relations to the Academy of Natural Sciences;' of Philadelphia, by Dr. Harrison Allen, given at the memorial meeting on April 10, 1895, and published by the committee in charge of publication.

theory of evolution as applied to living things, which brightening the horizon of science relieved it of all mists, such as the theories of Oken and its many variants, before men of Ryder's age looked toward the dawn for inspiration.

In America, to use Professor Packard's expression, a neo-Lamarckian phase of the theory of evolution arose. It held to an insistence of mechanical causes in modifying the shapes of organisms. Its advocates were Alpheus Hyatt and Edward D. Cope, men whom Darwin did not understand, but Ryder did; and, while he is in no respect a disciple of either of these distinguished men, his career was in a sense determined by them.

The forces which Ryder so eagerly studied were those which tended, as he believed they did, to modify endlessly the bodies in which they are exercised. The living body is compared by him to a machine in motion, which changes the shape of the machine itself by virtue of the motions; he believed that such changes are transmitted to offspring, and in this way organisms tend to endless variation. Nothing is fixed but the initial necessity to change.

Dr. Ryder might have done well had he confined himself more than he did to the study of species and genera. His papers in this line were excellent. He announced several forms of Thysanura, Myriapods, fresh water crustaceans, and a new fresh water polyp. He revised the account of the sturgeons of our eastern waters, and resuscitated Le Sueur's *Accipenser brevirostris*, an old specimen of which (probably part of the material on which the species was named) was found by Ryder in the Museum of the Academy.

In competent hands the elucidation of species is not, as it has opprobriously been said to be, a dullard's task of taking an inventory of nature, but the study of the ultimate forms which those organisms as-

sume which breed true. The shifting of color-schemes, the exhibition of the effects of retardation or precocity in the development of the individual, the effects of food and climate on size in whole or in parts, and of other causes by which minute differentiations are started and maintained, are of unending interest, and worthy of the best powers of the naturalist. If Ryder had been more closely identified than he was with the careers of the great academicians who had preceded him he would in no whit have detracted from the value of his philosophical labors. One cannot but regret, if for no other reason than for his health's sake, that he discontinued those fruitful excursions to our woods, ponds and rivers by which he contributed so notably to our micro-fauna.

With nameless regret, we note in what degree his exceptional powers were wasted. We see him in training as an oyster culturist, or busy with details of affairs on the Fish Commission. We see him giving his substance of energy to undergraduate instruction. Why do we insist that penknives are appropriate tools to fell oaks? that pedagogy is a suitable career for a man who has rare gifts for investigation? We may never see nor the world see the like of Ryder again. Why did we not get all that was possible from him while he was here, and leave the tasks of teaching undergraduates to those equally earnest with himself, to teachers as capable as himself, but who did not possess a tithe of his ability as an inquirer after truth? Teaching, it is true, gave him his maintenance, one which he preferred to any other. Alas! that there is no larger Jessup Fund for matured students as well as tyros! No complaint is here made that as compared with other students Ryder had not received due consideration. Nevertheless, bureau employment and teaching are not the best uses to which we can put exceptionally en-

dowed men. Ryder was patient and dignified. He was not a Pegasus chafing in his harness, but as one consecrated to the calling of his choice and on whose heart the lowliest duties on itself did lay. But we are the losers. We cannot but be saddened at the knowledge that he did not live to put in form and substance the results of his profound labors. His work is like an unfinished house webbed in scaffolding, with heaps of building material scattered about the ground. The spirits to which Ryder was kin (the Keats, the Mozarts), visit us at long intervals, and when they come we treat them as though they were ordinary mortals after all.

HARRISON ALLEN.

REPORTS OF INTERNATIONAL METEOROLOGICAL MEETINGS.

Two of these have lately been received; the first being the Report of the International Meteorological Congress, held at Chicago in August, 1893. This Congress was remarkable for the number of papers presented rather than for the number of persons who assembled to hear them read, and yet it seemed doubtful whether they could be published, as the Congress Auxiliary of the Columbian Exposition had no funds available. Fortunately, the U. S. Weather Bureau was able to accomplish this in its series of Bulletins, Bulletin 11, Part II., now before us, forming Part II. of the Report, which is devoted to history and bibliography, agricultural meteorology, atmospheric electricity and terrestrial magnetism. The first section is of special interest, as it contains a detailed account of the commencement and development of meteorology in the United States, with which the Army Medical Department, the Smithsonian Institution, the Hydrographic Office and the Signal Service were chiefly concerned. Two papers of much bibliographical interest, relating to English meteorological

literature from 1337 to 1699 and to meteorology and terrestrial magnetism in the fifteenth, sixteenth and seventeenth centuries, were contributed, respectively, by Mr. Symons, of London, and Dr. Hellmann, of Berlin, the two highest authorities on this subject. This Report is edited by Mr. O. L. Fassig, the able librarian of the Weather Bureau, who deserves great praise for effecting translations of the various foreign papers, with no pecuniary assistance, and otherwise performing a difficult task in so satisfactory a manner. Part I., which appeared more than a year ago, contained the papers on weather services and methods, rivers and floods and marine meteorology; while Part III. will comprise climatology, instruments and methods of observation and theoretical meteorology.

The second report to be mentioned is that of the International Meteorological Committee, chosen at the Munich Conference in 1891, which held its first meeting at Upsala in August, 1894. The proceedings are published in three languages, and the English edition, prepared by Mr. R. H. Scott, Secretary to the Committee, is issued as No. 115 of the official publications of the London Meteorological Office. The present members of the Committee and the countries which they represent are as follows: Messrs. von Bezold (Prussia), Billwiller (Switzerland), de Brito-Capello (Portugal), Davis (Argentine Republic), Eliot (India), Ellery (Victoria, Australia), Hann (Austria), Harrington (United States), Hepites (Roumania), Hildebrandsson (Sweden), Mascart (France), Mohn (Norway), Paulsen (Denmark), Scott (Great Britain), Snellen (Holland), Tacchini (Italy) and Wild (Russia). Among the most important resolutions was that the proposed International Meteorological Bureau was not realizable, but that the Committee appeared to be the proper body to establish and maintain relations between the